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# BIOLOGICAL BULLETIN

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## THE MARINE BIOLOGICAL LABORATORY.

### TWENTY-FOURTH REPORT, FOR THE YEAR 1921, THIRTY-FOURTH YEAR.

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### I. TRUSTEES, AUGUST 9, 1921.

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#### EX OFFICIO.

FRANK R. LILLIE, *Director*, The University of Chicago.

GILMAN A. DREW, *Assistant Director*, Marine Biological Laboratory.

D. BLAKELY, HOAR, *Treasurer*, 161 Devonshire Street, Boston, Mass.

GARY N. CALKINS, *Clerk of the Corporation*, Columbia University.

#### TO SERVE UNTIL 1925.

C. R. CRANE, New York, N. Y., *President of the Corporation*.

I. F. LEWIS, University of Virginia.

R. S. LILLIE, Nela Research Laboratory.  
E. P. LYON, University of Minnesota.  
C. E. McCLUNG, University of Pennsylvania.  
T. H. MORGAN, Columbia University.  
D. H. TENNENT, Bryn Mawr College.  
E. B. WILSON, Columbia University.

## TO SERVE UNTIL 1924.

H. H. DONALDSON, Wistar Institute of Anatomy and Biology.  
W. E. GARREY, Tulane University.  
CASWELL GRAVE, Washington University.  
M. J. GREENMAN, Wistar Institute of Anatomy and Biology.  
GEORGE LEFEVRE, University of Missouri, *Secretary of the Board*.  
A. P. MATHEWS, The University of Cincinnati.  
G. H. PARKER, Harvard University.  
C. R. STOCKARD, Cornell University Medical College.

## TO SERVE UNTIL 1923.

H. C. BUMPUS, Brown University.  
R. A. HARPER, Columbia University.  
W. A. LOCY, Northwestern University.  
JACQUES LOEB, The Rockefeller Institute for Medical Research.  
GEORGE T. MOORE, Missouri Botanical Garden, St. Louis.  
L. L. NUNN, Telluride, Colo.  
W. J. V. OSTERHOUT, Harvard University.  
WILLIAM M. WHEELER, Bussey Institution, Harvard University.

## TO SERVE UNTIL 1922.

CORNELIA M. CLAPP, Mount Holyoke College.  
E. G. CONKLIN, Princeton University.  
ROSS G. HARRISON, Yale University.  
\* CAMILLUS G. KIDDER, 27 William Street, New York City.  
M. M. METCALF, Oberlin, Ohio.  
WILLIAM PATTEN, Dartmouth College.  
JACOB REIGHARD, University of Michigan.  
W. B. SCOTT, Princeton University.

\* Deceased.

## II. ACT OF INCORPORATION.

No. 3170.

## COMMONWEALTH OF MASSACHUSETTS.

Be It Known, That whereas Alpheus Hyatt, William Sanford Stevens, William T. Sedgwick, Edward G. Gardiner, Susan Minns, Charles Sedgwick Minot, Samuel Wells, William G. Farlow, Anna D. Phillips and B. H. Van Vleck have associated themselves with the intention of forming a Corporation under the name of the Marine Biological Laboratory, for the purpose of establishing and maintaining a laboratory or station for scientific study and investigation, and a school for instruction in biology and natural history, and have complied with the provisions of the statutes of this Commonwealth in such case made and provided, as appears from the certificate of the President, Treasurer, and Trustees of said Corporation, duly approved by the Commissioner of Corporations, and recorded in this office;

*Now, therefore*, I, HENRY B. PIERCE, Secretary of the Commonwealth of Massachusetts, *do hereby certify* that said A. Hyatt, W. S. Stevens, W. T. Sedgwick, E. G. Gardiner, S. Minns, C. S. Minot, S. Wells, W. G. Farlow, A. D. Phillips, and B. H. Van Vleck, their associates and successors, are legally organized and established as, and are hereby made, an existing Corporation, under the name of the MARINE BIOLOGICAL LABORATORY, with the powers, rights, and privileges, and subject to the limitations, duties, and restrictions, which by law appertain thereto.

*Witness* my official signature hereunto subscribed, and the seal of the Commonwealth of Massachusetts hereunto affixed, this twentieth day of March, in the year of our LORD ONE THOUSAND, EIGHT HUNDRED and EIGHTY-EIGHT.

HENRY B. PIERCE,

[SEAL.]

*Secretary of the Commonwealth.*

## III. BY-LAWS OF THE CORPORATION OF THE MARINE BIOLOGICAL LABORATORY.

I. The annual meeting of the members shall be held on the second Tuesday in August, at the Laboratory, in Woods Hole, Mass., at 12 o'clock noon, in each year, and at such meeting the members shall

choose by ballot a Treasurer and a Clerk, who shall be, *ex officio*, members of the Board of Trustees, and Trustees as hereinafter provided. At the annual meeting to be held in 1897, not more than twenty-four Trustees shall be chosen, who shall be divided into four classes, to serve one, two, three, and four years, respectively, and thereafter not more than eight Trustees shall be chosen annually for the term of four years. These officers shall hold their respective offices until others are chosen and qualified in their stead. The Director and Assistant Director, who shall be chosen by the Trustees, shall also be Trustees, *ex officio*.

II. Special meetings of the members may be called by the Trustees, to be held in Boston or in Woods Hole at such time and place as may be designated.

III. The Clerk shall give notice of meetings of the members by publication in some daily newspaper published in Boston at least fifteen days before such meeting, and in case of a special meeting the notice shall state the purpose for which it is called.

IV. Twenty-five members shall constitute a quorum at any meeting.

V. The Trustees shall have the control and management of the affairs of the Corporation; they shall present a report of its condition at every annual meeting; they shall elect one of their number President and may choose such other officers and agents as they may think best; they may fix the compensation and define the duties of all the officers and agents; and may remove them, or any of them, except those chosen by the members, at any time; they may fill vacancies occurring in any manner in their own number or in any of the offices. They shall from time to time elect members to the Corporation upon such terms and conditions as they may think best.

VI. Meetings of the Trustees shall be called by the President, or by any two Trustees, and the Secretary shall give notice thereof by written or printed notice sent to each Trustee by mail, postpaid. Seven Trustees shall constitute a quorum for the transaction of business. The Board of Trustees shall have power to choose an Executive Committee from their own number, and to delegate to such Committee such of their own powers as they may deem expedient.

VII. The President shall annually appoint two Trustees, who shall constitute a committee on finance, to examine from time to time the books and accounts of the Treasurer, and to audit his accounts at the close of the year. No investments of the funds of the Corporation shall be made by the Treasurer except approved by the finance committee in writing.

VIII. The consent of every Trustee shall be necessary to dissolution of the Marine Biological Laboratory. In case of dissolution, the property shall be given to the Boston Society of Natural History, or some similar public institution, on such terms as may then be agreed upon.

IX. These By-Laws may be altered at any meeting of the Trustees, provided that the notice of such meeting shall state that an alteration of the By-Laws will be acted upon.

X. Any member in good standing may vote at any meeting, either in person or by proxy duly executed.

#### IV. TREASURER'S REPORT.<sup>1</sup>

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Harvey S. Chase & Company,  
Certified Public Accountants, 84 State Street, Boston.

January 21, 1922.

MR. D. BLAKELY HOAR,  
161 Devonshire Street,  
Boston.

*Dear Sir:* We have completed our audit of the accounts of the Marine Biological Laboratory for the year ended December 31 1921, as kept both at your office in Boston and at Woods Hole and report thereon in the accompanying exhibits and schedules:

Exhibit A—Balance Sheet as of December 31, 1921.

Exhibit B—Income and Expense for the Year ended December 31, 1921.

Schedule I—Investments (Book Values).

Schedule II—Cash Receipts and Disbursements on Account of Funds.

Schedule III—Land, Buildings, and Equipment.

Schedule IV—Supply Department Income and Expense Account for the Year ended December 31, 1921.

We certify that, subject to the comments herewith, the balance sheet and income and expense statement shown in Exhibits A and

<sup>1</sup> Only a part of the audit is included in the Treasurer's report. The complete audit is on file at the Laboratory and may be examined by any member.

B are in accordance with the books and correct to the best of our knowledge and belief.

Very respectfully,

(Signed) HARVEY L. CHASE & COMPANY,  
*Certified Public Accountants.*

MARINE BIOLOGICAL LABORATORY BALANCE SHEET, DECEMBER 31,  
1921.

*Assets.*

Cash:

In bank.....	\$1,548.37	
Petty cash fund.....	200.00	\$1,748.37

Notes receivable (secured).....		1,000.00
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Accounts receivable.....		9,687.22
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Inventories:

Supply department.....	20,152.90	
BIOLOGICAL BULLETIN.....	3,535.95	23,688.85

Investments:

Securities (Schedule I.).....	\$11,694.87	
Less loan.....	1,500.00	10,194.57
Cash (Schedule II.).....	809.87	11,004.44
Stock in General Biological Supply House, Inc.		12,700.00

Gansett property account.....	20,754.95	
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Less mortgage.....	11,582.01	9,172.94
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Educational Plant (Schedule III.)

Land.....	95,856.14	
Buildings.....	207,855.06	
Equipment.....	98,465.02	
	400,176.22	
Less reserve for depreciation.....	42,070.17	358,106.05

Deferred charges:

Prepaid insurance.....		2,786.43
Items in suspense.....		336.98
		<u>\$430,251.28</u>

*Liabilities.*

Accounts payable.....	\$2,863.84
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Notes payable:

Falmouth National Bank.....	10,000.00
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Accrued charges (estimated).....	1,000.00
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Items in suspense:

Friendship Fund donation for 1922 expenses...	\$5,000.00	
Amount received from Marine Biological Laboratory Club for repairs to club house.....	500.00	
Other items.....	105.87	5,605.87

Trust funds.....		11,004.44
------------------	--	-----------

\$30,474.15

## Balancing Account:

Balance, January 1, 1921.....\$385,582.48

## Add:

Special Donations received during year for  
completing third floor of New Labora-  
tory Building:

Nela Research Laboratory.... \$3,000.00

Eli Lilly Co..... 3,000.00

Friendship Fund, Inc..... 1,500.00      7,500.00

Balance of Income Account for Year (Ex-  
hibit B)..... 3,994.65Special Donations received in 1919 and  
1920 towards purchase of stock of Gen-  
eral Biological Supply House..... 2,700.00

399,777.13

\$430,251.28MARINE BIOLOGICAL LABORATORY, INCOME AND EXPENSES FOR  
YEAR ENDED DECEMBER 31, 1921.

	Expenses	Income	Loss	Gain
Administration expenses.....	\$9,657.82		9,657.82	
Bar Neck Property expense.....	340.82		340.82	
BIOLOGICAL BULLETIN and annual dues.....	4,186.35	3,537.15	649.20	
BIOLOGICAL BULLETIN, adjustment of expenses for 1920.....		347.58		347.58
Carpenter department.....	1,044.09	7.58	1,036.51	
Chemical department.....	1,763.77		1,763.77	
Dormitories.....	2,609.21	2,467.62	141.59	
Instruction.....	6,915.60	8,882.50		1,966.90
Janitor's house expenses.....	7.68		7.68	
Interest on notes payable.....	570.00		570.00	
Library department.....	1,979.12		1,979.12	
Maintenance, buildings and grounds.....	6,919.63		6,919.63	
Mess.....	23,264.52	24,556.41		1,291.89
New laboratory.....	3,994.07		3,994.07	
Newman Cottage.....	73.90	150.00		76.10
Pumping station.....	514.83		514.83	
Research department.....	2,605.57	6,325.00		3,719.43
Sundry expense and income.....	1,241.89	9,243.76		8,001.87
Supply department (See Schedule IV.).....	41,561.10	42,774.78		1,213.68
Truck.....	720.43		720.43	
Total current expenses.....	109,970.40		28,295.47	
Total current income.....	98,292.38	98,292.38	16,617.45	16,617.45
Excess of expenses.....	11,678.02		11,678.02	



Reserve for depreciation.....	7,270.69
Bad accounts written off.....	204.64
	<u>19,153.35</u>

## Donations for Expenses:

Friendship Fund..	\$20,000.00	
Frances C. Lillie...	3,000.00	
Other.....	148.00	23,148.00
Balance to balancing account.....		<u>\$3,994.65</u>

MARINE BIOLOGICAL LABORATORY INVESTMENTS, DECEMBER 31,  
1921.*Reserve Fund.*

Cash on hand.....	\$460.06	
*\$3,000.00 American Telephone & Telegraph Company, 4's..	2,921.25	
500.00 Western Telephone & Telegraph Company, 5's...	496.88	
*6 shares American Smelting & Refining Company, Preferred.....	732.00	
8 shares General Electric Company.....	907.25	
14 shares United Shoe Machinery Corporation, Preferred...	393.75	
5 shares Massachusetts Gas Companies, Preferred.....	444.63	
	<u>6,355.82</u>	
Items marked * are held as collateral on loan of.....	1,500.00	\$4,855.82

*Library Fund.*

\$300.00 U. S. Liberty Loan, 4 1/4's.....	300.00	
4/5 of \$1,000.00 American Telephone & Telegraph Company, 4's.....	779.00	
3 shares American Telephone & Telegraph Company.....	372.90	
3 shares General Electric Company.....	346.80	
5 shares United Shoe Machinery Corporation, Preferred...	140.63	
3 shares Massachusetts Gas Companies, Preferred.....	269.38	
1 share American Smelting & Refining Company, Preferred.	122.00	
	<u>2,330.71</u>	
Overdraft of cash.....	261.84	2,068.87

*Lucretia Crocker Fund.*

Cash on hand.....	611.65	
\$300.00 U. S. Liberty Loan, 1st Convertible 4 1/4's.....	300.00	
1/5 of \$1,000.00 American Telephone & Telegraph Company, 4's.....	194.75	
18 shares Vermont & Massachusetts Railroad Company.....	2,416.50	
3 shares General Electric Company.....	349.55	
1 share West End Street Railway Company.....	83.00	
1 share American Telephone & Telegraph Company.....	124.30	4,079.75
Total—Exhibit A.....		<u>\$11,004.44</u>

## V. REPORT OF THE LIBRARIAN.

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The Library has enjoyed a steady growth since the previous report, the total number of books added to the Library being 929. Of these 78 volumes were received by purchase, 293 by binding of periodicals, 105 as gifts, and 26 as permanent loans from the American Museum of Natural History. To these should be added 427 reprints, mostly in pamphlet form. During the year the number of periodicals received has been 260 titles, of which 97 are received by subscription, 52 by exchange for the BIOLOGICAL BULLETIN, 99 are gifts, one is received by advertising, and 11 periodicals are sent to us from the duplicates of the American Museum of Natural History as loan. At the end of the year the total contents of the Library is 10,663 volumes and 8,959 pamphlets.

The Library has been fortunate in receiving a number of valuable gifts of books and of money. We may mention especially a gift of \$50 from Miss Anna E. Lagemann, of \$88 from Dr. Frank R. Lillie for the purchase of certain sets of journals, and \$10 from Dr. Alfred G. Mayor for subscriptions to periodicals. Of books, we have received from the authors—

“The Nature of Animal Light,” E. Newton Harvey.

“The Grand Strategy of Evolution,” William Patten.

“Physiological Chemistry,” 3d edition, Albert P. Matthews.

“Human Behavior,” Stewart Paton.

From Messrs. Squibbs we have received their “Materia Medica,” and from Messrs. Merck & Co., Benjamin L. Murray’s “Standard Tests for Reagent Chemicals, 1920.” An especially interesting gift is a volume of “Ramblers of a Naturalist, 1857,” by de Quatrefages. This book is given by Mr. William Beer, Librarian of the Howard Memorial Library of New Orleans. Mr. Beer visited Wood’s Hole in the summer of 1920, was much interested in our Library, and has sent this book in recognition of the friendships then established. Dr. H. H. Donaldson has very kindly given us a copy of Cattell’s “American Men of Science,” edition 3, and from the Rev. Mr. Tingley we have received a copy of Porter, “The Human Intellect,” and Barrett, “Threshold of the Unseen.” The Librarian also wishes to express thanks for friendly sugges-

tions received from various members of the laboratory, especially Dr. Pond, Dr. Osterhout, and Dr. Franklin.

During the winter preceding the opening of the laboratory the Assistant Librarian rearranged the books in the Library, placing them in three series. Ordinary books are arranged at the west end of the Library and placed in order according to the Dewey decimal classification, the classification being somewhat minute with a view to future expansion. The journals are arranged in the next section of the Library and classified into a few broad classes. Under each class the journals are arranged alphabetically by title. The reprints are massed at the east end of the Library and are all arranged alphabetically. We have been able to complete ten important sets of journals by purchase, exchange, or gifts. Among the important ones that have been completed are—

*Morphologisches Jahrbuch,*

*Quarterly Journal of Microscopic Science,*

*The New Phytologist,*

*La Cellule,*

*Proceedings of the Boston Society of Natural History.*

The dictionary catalogue, which was started last year, now contains 8,637 cards. The use of the Library has increased considerably, the circulation for the year 1921 being 1,200 items. The new forms which have been devised for keeping records have proved very satisfactory and useful.

The needs of the Library are numerous and various. We may mention especially (1) reprints, of which none have been received recently from members of the laboratory. Authors are requested to look over the reprints in the Library when visiting Wood's Hole and to send us what are lacking; (2) larger appropriations are needed for the purchase of books much in demand; (3) special needs are—a good encyclopedia, bibliographical aids, such as the Zoölogical Record after 1893, the International Catalogue sections on botany, physiology, etc., from the beginning, The Royal Society Catalogue of Scientific Papers; and, finally, much more room is needed for the growth of the Library, and we are looking forward to this need being satisfied in the near future.

R. P. BIGELOW,  
*Librarian.*

## VI. THE DIRECTOR'S REPORT.

TO THE TRUSTEES OF THE MARINE BIOLOGICAL LABORATORY.

*Gentlemen:* I beg to present herewith a report of the thirty-fourth session of the Marine Biological Laboratory for the year 1921.

The session was in every sense a successful one; the attendance, which was far in excess of any previous year in the number of investigators, confirms again the status of the Laboratory as an effective organization for the promotion of biological research. The student attendance was the same as the preceding year, 120 in all courses, a number which has been fixed as a maximum with our present accommodations. The increase of the fee for courses from \$50.00 to \$75.00 first put into effect in 1921 thus did not operate to reduce attendance.

One hundred and seventy-two investigators, 36 more than in any preceding year, worked at the Laboratory. This was rendered possible by the completion of nine additional rooms in the brick building, with aid from the Nela Research Laboratory and Eli Lilly and Company acknowledged in the preceding report, by the use of five additional rooms in the newly completed laboratory of the Supply Department, and by assignments to the Laboratory of the Bureau of Fisheries at Wood's Hole generously placed at our disposal by the Commissioner, Dr. Hugh M. Smith. It would have been impossible to accommodate so many workers in the regular laboratories.

Fifty-two universities and colleges and research institutions subscribed for research rooms, or investigators' or students' tables (see appended list). This was the same number as in 1920, but the amount subscribed increased from \$6,210.00 in 1920 to \$8,800.00 in 1921. The total number of institutions represented by workers at the Laboratory was 95 scattered throughout practically all of the Eastern and Middle Western States. Workers from England, Holland, Russia, China, and Japan represented a growing international interest in the Laboratory.

Medical interests were represented by forty-one investigators and five students from twenty-seven medical institutions of this

country, Canada, England, and China. When it is considered what a high percentage of other investigators on the side of animal biology are concerned in teaching and investigation of pre-medical subjects, it is fair to say that the relation of the Laboratory to medical interests is very close indeed. This is, of course, not a new situation in the Laboratory, but it is one that is developing strength year by year.

It is probably worth while at this time to give a summary comparison of the finances of the Laboratory for the last six years, because the financing of educational institutions has been notoriously difficult owing to rising costs, and most readers of the report will not take the time to compare the detailed reports of the treasurer for successive years. The following table gives a summary of the chief items of interest for the last six years:

	Expense.	Earned Income.	Donations for Current Expense.	Surplus without Depreciation.
1916.....	\$ 68,002.65	\$52,776.87	\$20,000.00	\$ 4,774.22
1917.....	69,753.70	52,504.85	20,000.00	2,751.15
1918.....	69,687.14	54,282.05	20,000.00	4,594.91
1919.....	88,452.64	80,307.57	20,260.00	12,114.93
1920.....	103,097.64	89,943.04	20,060.00	6,905.40
1921.....	109,970.40	98,292.38	23,148.00	11,469.28

	Assets.	Liabilities.	Reserve for Depreciation.	Trust Funds.
1916.....	\$329,845.93	\$19,503.66	\$ 6,942.12	\$ 8,764.55
1917.....	382,943.30	19,500.40	8,881.82	9,285.59
1918.....	359,902.79 <sup>1</sup>	17,019.79	21,140.24	9,954.03
1919.....	376,307.31	20,429.21	28,543.46	10,583.41
1920.....	411,123.63	27,263.50	34,799.48	10,409.66
1921.....	430,251.28	31,051.72	42,070.17	11,004.44

It will be observed that, in spite of the great increases in cost of operation (expense) during this time, the earned income has maintained a very satisfactory ratio, so that the fairly constant donation account has left a "surplus" each year, if such it may be called; this has all been used, together with the special gifts, acknowledged in the reports, for the additions and improvements that have been found necessary, such as rebuilding the mess hall, erection of the

<sup>1</sup> Decrease due to separate setting up of Gansett property account.

Supply Department Laboratory, completion of the brick building, increases of equipment, and in other minor ways, all of which are reflected in the increase of assets. The liabilities are made up for this table of the sum of accounts and notes payable, mortgage on the Gansett property and various lesser amounts, varying from year to year. The increase to be noted since 1918 is due mainly to loans amounting to \$10,000 necessary to complete the heavy building and improvement operations of the last three years. The reserve for depreciation is merely a book charge diminishing the assets by the stated amount. The income of the small Trust Funds is allowed to accumulate, for the most part, and this accounts for their increase from year to year.

The treasurer's report for the current year (p. 279) reflects a satisfactory state of affairs so far as current expenses go. The increase of income over 1920, amounting to \$8,349.34, is due to increase in receipts from instruction (from \$5,960.00 in 1920 to \$8,882.50 in 1921), from contributions for research rooms and tables (\$4,450.00 and \$6,325.00 in 1920 and 1921, respectively), from "Sundry Income," made up mostly of a charge of 6 per cent. on the investments in the mess, supply department, and dormitories (\$7,030.75 and \$9,243.76 in 1920 and 1921, respectively), and an increase of a little over \$1,000.00 in the receipts from the mess. The receipts of the Supply Department, on the other hand, were nearly \$1,000.00 less in 1921 than in 1920, which is, after all, a surprisingly small reduction in the face of the very adverse business conditions.

The new laboratory of the Supply Department and the additional rooms in the brick building were completed early in 1921 and were in use during the summer season.

Renewed and very careful consideration was given to the plans for the new buildings proposed in the reports for 1919 and 1920 and to means of securing funds for their construction and maintenance. A decision was soon reached to combine the three main needs, viz., a laboratory for biophysics and biochemistry, an auditorium, and library, in one building continuous with the present brick building, in order to use the land more economically, to simplify care of the buildings, and make the various departments more accessible to all workers; at the same time the plan provided

a quiet corner for the auditorium in the angle between the two wings protecting it completely from the noise of the street. In their work on these plans the Executive Committee were able to rely on the advice and assistance of Mr. Charles A. Coolidge, at every stage, as in the plans studied in the summer of 1920. Drawings were made by Messrs. Coolidge and Shattuck of Boston and were repeatedly criticized and improved, detail by detail, by the workers at the Laboratory. The plans reached an advanced state of completion by the end of the summer, and the architects were then instructed to prepare final drawings and specifications and to secure contractors' estimates on the cost of construction.

During the year also efforts were continued with the aid of the National Research Council to secure the necessary funds for the building and its endowment, estimated at about one million dollars. The project was presented to the Rockefeller Foundation and the Carnegie Corporation by officers of the National Research Council early in the year, and opportunity was given during the session by both organizations for a full presentation of the needs and plans of the Laboratory by our Executive Committee. Both organizations had the matter under favorable consideration at the end of the year.

We are not asking for a large endowment in connection with the new building, but for only enough so that the operation of the new addition should not be unduly burdensome. Our aim should be to develop and extend the system of contributions from research sources of all kinds and to expand the business of the Supply Department and of all other sources of revenue. The Laboratory should depend largely upon coöperative support, to the least possible extent upon endowment. The morale and strength of the organization depend upon the necessity of its members working together for its support and its growth. The Laboratory will thus best maintain its ideals and become increasingly effective in the advancement of science.

The membership of our Corporation and Board of Trustees is composed almost entirely of scientific men; such a body is not usually considered well qualified to deal with matters of investment connected with relatively large endowments. On the other hand, to create another body, as an integral part of the Laboratory, that

would have control of finances, would inevitably weaken the control of the scientific men over the policies of the Laboratory in general. Our Board of Trustees for these reasons adopted the policy that any endowment that should be created in connection with the present undertaking should be held in trust for the Laboratory by an outside body, which should pay in the income to the Laboratory for operating expenses.

If we realize these immediate aims within the next year or two, other practical problems will arise. The most serious of these probably is the housing problem which will be created by the increased attendance. This will be an important limiting factor in the growth of the Laboratory. There should be added a building capable of accommodating about 50 persons in separate rooms or small suites, situated as close to the Laboratory buildings and mess hall as possible. We should also erect about ten small bungalows, furnished and equipped for light housekeeping, on the Gansett tract, to accommodate some of our married members who can not now find reasonably priced and suitable accommodations for their families. About \$75,000.00 is needed for these purposes. The rentals would furnish an addition to the income of the Laboratory, though it could not be expected to yield a high rate of return on the investment.

At the invitation of the Director, the Committee on Physiological Optics of the National Research Council held a session at the Laboratory from July 19 to July 22, inclusive. Advantage was taken of this occasion to hold several conferences on the general subject of biophysics between the members of the committee and investigators at the Laboratory. Demonstrations of biophysical investigations in progress were also held, and the sessions culminated in a symposium on "The Requirements of Biologists from Physical Science and on the Equipment of a Biophysical Laboratory." Numerous suggestions were received by the officers of the Laboratory for incorporation in the new plans. As one of the very few occasions in which the border-line problems between physics and biology have been discussed by specialists on both sides, the occasion was noteworthy. It should be regarded merely as a beginning of fruitful coöperation in biophysical research.

At the meeting of the Corporation August 9, 1921, four new



members were elected to the Board of Trustees in the class of 1925: Professor I. F. Lewis, of the University of Virginia; Dr. R. S. Lillie, of the Nela Research Laboratories; Professor E. P. Lyon, of the University of Minnesota, and Professor D. H. Tennent, of Bryn Mawr College.

As part of their report to the Carnegie Corporation the Executive Committee drafted a statement concerning the Organization and Policies of the Marine Biological Laboratory. As this is the first attempt at such a formulation, it is herewith printed (p. 304) as part of the Director's report for the criticism of the members of the Laboratory. It is not intended to constitute a set of regulations. It is descriptive of the practices that have grown up in the past thirty-four years and of the traditions that have been established; thirty-four years hence such a statement may have considerable interest, after those who were concerned in the early history of the Laboratory shall have departed from this scene.

There are appended as parts of this report: (1) A list of the staff for 1921, (2) A list of investigators and students in attendance in 1921, (3) A tabular view of attendance for the last five years, (4) A list of the subscribing and coöperating institutions in 1921, (5) The Evening Lectures, (6) A statement concerning the Organization and Policies of the Marine Biological Laboratory, (7) A list of members of the Corporation.

## I. THE STAFF.

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1921.

FRANK R. LILLIE, *Director*, Professor of Embryology, and Chairman of the Department of Zoölogy, The University of Chicago.

GILMAN A. DREW, *Assistant Director*, Marine Biological Laboratory.

## ZOÖLOGY.

### I. INVESTIGATION.

GARY N. CALKINS, Professor of Protozoölogy, Columbia University.

E. G. CONKLIN, Professor of Zoölogy, Princeton University.

GILMAN A. DREW, Assistant Director, Marine Biological Laboratory.

GEORGE LEFEVRE, Professor of Zoölogy, The University of Missouri.

FRANK R. LILLIE, Professor of Embryology, The University of Chicago.

C. E. McCLUNG, Professor of Zoölogy, University of Pennsylvania.

T. H. MORGAN, Professor of Experimental Zoölogy, Columbia University.

E. B. WILSON, Professor of Zoölogy, Columbia University.

## II. INSTRUCTION.

W. C. ALLEE, Professor of Biology, Lake Forest College.

EDWARD J. ADOLPH, Instructor in General Physiology, University of Pittsburgh.

ROBERT HALL BOWEN, Instructor in Zoölogy, Columbia University.

J. A. DAWSON, Professor of Biology, Dalhousie University.

C. L. PARMENTER, Instructor in Zoölogy, University of Pennsylvania.

CHRISTIANNA SMITH, Instructor in Zoölogy, Mount Holyoke College.

J. P. VISSCHER, Instructor in Zoölogy, Washington University.

DONNELL B. YOUNG, Assistant Professor of Zoölogy, Carlton College.

## PROTOZOOLOGY.

### I. INVESTIGATION.

(*See Zoölogy.*)

### II. INSTRUCTION.

GARY N. CALKINS, Professor of Protozoölogy, Columbia University.

LOUISE H. GREGORY, Assistant Professor of Zoölogy, Columbia University.

## EMBRYOLOGY.

### I. INVESTIGATION.

(*See Zoölogy.*)

### II. INSTRUCTION.

DAVID H. TENNENT, Professor of Biology, Bryn Mawr College.

HUBERT B. GOODRICH, Associate Professor of Zoölogy, Wesleyan University.

BENJAMIN H. GRAVE, Professor of Biology, Wabash College.

CHARLES G. ROGERS, Professor of Comparative Physiology, Oberlin College.

ELIZABETH A. SMITH, Assistant Professor of Zoölogy, University of Wisconsin.

## PHYSIOLOGY.

## I. INVESTIGATION.

ALBERT P. MATHEWS, Professor of Biochemistry, The University of Cincinnati.

HAROLD C. BRADLEY, Assistant Professor of Physiological Chemistry, University of Wisconsin.

WALTER E. GARREY, Professor of Physiology, Tulane University.

RALPH S. LILLIE, Biologist, Nela Research Laboratory, Department of Pure Science, Nela Park, Cleveland, Ohio.

## II. INSTRUCTION.

RALPH S. LILLIE, Biologist, Nela Research Laboratory, Department of Pure Science, Nela Park, Cleveland, Ohio.

MERKEL H. JACOBS, Assistant Professor of Zoölogy, University of Pennsylvania.

FRANK P. KNOWLTON, Professor of Physiology, Syracuse University.

REYNOLD A. SPAETH, Associate in Physiology, School of Hygiene and Public Health, Johns Hopkins University.

## PHILOSOPHICAL ASPECTS OF BIOLOGY AND ALLIED SCIENCES.

## LECTURER.

EDWARD G. SPAULDING, Professor of Philosophy, Princeton University.

## BOTANY.

## I. INVESTIGATION.

S. C. BROOKS, Department of Public Health, Washington, D. C.

EDWARD M. EAST, Professor of Experimental Plant Morphology, Harvard University.

ROBERT A. HARPER, Professor of Botany, Columbia University.

E. NEWTON HARVEY, Assistant Professor of Physiology, Princeton University.

WINTHROP J. V. OSTERHOUT, Professor of Botany, Harvard University.

## II. INSTRUCTION.

IVEY F. LEWIS, Professor of Biology, University of Virginia.

JACOB R. SCHRAMM, Professor of Botany, College of Agriculture, Cornell University.

WILLIAM RANDOLPH TAYLOR, Instructor in Botany, University of Pennsylvania.

### LIBRARY.

ROBERT P. BIGELOW, Librarian and Associate Professor of Zoölogy and Parasitology, Massachusetts Institute of Technology. Librarian.

PRISCILLA B. MONTGOMERY (Mrs. Thomas H. Montgomery, Jr.), Assistant Librarian.

### CHEMICAL SUPPLIES.\*

OLIVER S. STRONG, Associate Professor of Neurology, Columbia University, New York City, Chemist.

### SUPPLY DEPARTMENT.

G. M. GRAY, Curator.

JOHN J. VEEDER, Captain.

E. M. LEWIS, Engineer.

A. W. LEATHERS, Head of Shipping Department.

A. M. HILTON, Collector.

J. MCINNIS, Collector.

F. M. MACNAUGHT, Business Manager.

HERBERT A. HILTON, Superintendent of Building and Grounds.

## 2. INVESTIGATORS AND STUDENTS—1921.

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### INDEPENDENT INVESTIGATORS—Zoölogy.

ADDISON, WILLIAM H. F., Professor of Histology and Embryology, University of Pennsylvania.

ADOLPH, EDWARD F., University of Pittsburgh.

ALLEE, WARDER C., Assistant Professor of Zoölogy, University of Chicago.

ALLEN, EZRA, Head of Biology Department, Ursinus College.

BAKER, HORACE B., Instructor, University of Pennsylvania.

BIGELOW, ROBERT P., Associate Professor of Zoölogy and Parasitology, Massachusetts Institute of Technology.

BORING, ALICE M., Associate Professor of Zoölogy, Wellesley College.

BOWEN, ROBERT H., Instructor in Zoölogy, Columbia University.

CALKINS, GARY N., Professor of Protozoölogy, Columbia University.

CAROTHERS, ELEANOR E., University of Pennsylvania.

CARROLL, MITCHELL, Professor of Biology, Franklin and Marshall College.

\* Compound microscopes, with two oculars and two objectives, rack and pinion and fine adjustment, may be rented for the season at \$7.00 each, provided notice is received by the Business Manager not later than June 1. Microscopes are not otherwise supplied by the Laboratory.

- CHAMBERS, ROBERT, Assistant Professor of Anatomy, Cornell University Medical College.
- CHARLTON, HARRY H., Assistant Professor, University of Missouri.
- CHIDESTER, FLOYD E., Associate Professor of Zoölogy, West Virginia University.
- CLAPP, CORNELIA M., Professor Emeritus of Zoölogy, Mount Holyoke College.
- CLARK, ELIOT R., Professor of Anatomy, University of Missouri.
- CLARK, ELEANOR L., Columbia, Mo.
- COPELAND, MANTON, Professor of Biology, Bowdoin College.
- COWDRY, E. V., Associate Member, Rockefeller Institute.
- DANCHAKOFF, VERA, Assistant Professor of Anatomy, College of Physicians and Surgeons.
- DANFORTH, CHARLES H., Associate Professor of Anatomy, Washington University School of Medicine.
- DART, RAYMOND A., Demonstrator of Anatomy, University of London.
- DAWSON, JAMES A., Professor of Biology, Dalhousie University.
- DONALDSON, HENRY H., Professor of Neurology, Wistar Institute.
- DREW, GILMAN A., Assistant Director, Marine Biological Laboratory, Woods Hole, Mass.
- GALTISOFF, PAUL S., 278 Hawthorne Ave., Yonkers, N. Y.
- GLASER, OTTO C., Professor of Biology, Amherst College.
- GOODRICH, H. B., Associate Professor of Zoölogy, Wesleyan University.
- GRAVE, CASWELL, Professor of Zoölogy, Washington University.
- GRAVE, BENJAMIN H., Professor of Zoölogy, Wabash College.
- GREGORY, LOUISE H., Assistant Professor of Zoölogy, Barnard College.
- HAUSMAN, LEON A., Instructor in Biology and Protozoölogy, Cornell University.
- HEMMETER, JOHN C., Professor, University of Maryland.
- HEILBRUNN, LEWIS V., Assistant Professor of Zoölogy, University of Michigan.
- HENSHAW, HENRY W., Washington, D. C.
- HESS, WALTER N., Professor of Zoölogy, DePauw University.
- HOGUE, MARY J., Instructor, Johns Hopkins University Medical School.
- HOSKINS, MARGARET M., Medical College, University of Virginia.
- HOWE, HARRISON E., Chairman Division Research Extension, National Research Council, Washington, D. C.
- JACOBS, MERKEL H., Assistant Professor of Zoölogy, University of Pennsylvania.
- JENNINGS, HERBERT S., Professor of Zoölogy, Johns Hopkins University.
- JUST, ERNEST E., Professor of Zoölogy, Howard University.
- KINDRED, JAMES E., Assistant Professor of Biology, Western Reserve University.
- KNOWER, HENRY McE., Professor of Anatomy, University of Cincinnati.
- LEFEVRE, GEORGE, Professor of Zoölogy, University of Missouri.
- LILLIE, FRANK R., Chairman, Department of Zoölogy, University of Chicago.
- LINTON, EDWIN, Honorary Fellow in Zoölogy, University of Missouri.
- MACCALLUM, G. A., 925 St. Paul St., Baltimore, Md.
- McCLUNG, C. E., Director of Zoölogical Laboratory, University of Pennsylvania.
- MARTIN, BERTHA E., Associate Professor of Zoölogy, Mount Holyoke College.

- MAST, SAMUEL O., Professor of Zoölogy, Johns Hopkins University.  
MEDES, GRACE, Assistant Professor, Vassar College.  
MINER, ROY W., American Museum of Natural History, New York City.  
MORRILL, CHARLES V., Assistant Professor of Anatomy, Cornell University Medical College.  
OKKELBERG, PETER, Assistant Professor of Zoölogy, University of Michigan.  
PACKARD, CHARLES, Assistant Professor of Biology, Peking Union Medical College.  
PARMENTER, CHARLES L., Instructor, University of Pennsylvania.  
PATTEN, WILLIAM, Professor of Biology, Dartmouth College.  
PEEBLES, FLORENCE, Bryn Mawr, Pa.  
PINNEY, MARY E., Professor of Biology, Lake Erie College.  
PLOUGH, HAROLD H., Associate Professor of Biology, Amherst College.  
REESE, ALBERT M., Professor of Zoölogy, West Virginia University.  
ROGERS, CHARLES G., Professor of Comparative Physiology, Oberlin College.  
SCHRADER, FRANZ, Bryn Mawr College.  
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SLOSSON, EDWIN S., Editor of Science Service, Washington, D. C.  
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STRONG, OLIVER S., Associate Professor of Neurology, Columbia University.  
SWINGLE, WILTON W., Assistant Professor of Zoölogy, Yale University.  
TENNETT, DAVID H., Professor of Biology, Bryn Mawr College.  
TRACY, HENRY C., Professor of Anatomy, University of Kansas.  
WHEDON, ARTHUR D., Instructor in Zoölogy, University of Pennsylvania.  
WHITE, GERTRUDE M., Instructor, Carnegie Institute of Technology.  
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WOOD, F. E., Professor of Biology, Illinois Wesleyan University.

#### BEGINNING INVESTIGATORS—Zoölogy.

- ATTERBURY, RUTH R., Instructor, College of Physicians and Surgeons, New York City.  
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DELLINGER, SAMUEL C., Assistant Professor, University of Arkansas.  
GEIZER, SAMUEL W., Bruce Fellow, Johns Hopkins University.  
GILSON, ARTHUR S., JR., Harvard University.  
GUTHRIE, MARY J., Bryn Mawr College.  
HAYDEN, MARGARET A., Instructor in Zoölogy, Wellesley College.  
HIBBARD, HOPE, Assistant Professor of Biology, Elmira College.  
HINRICHS, MARIE A., Instructor, Vassar College.  
HOADLEY, LEIGH, University of Chicago.  
JOHNSON, GEORGE E., Professor of Biology, University of Porto Rico.

LOWTHER, FLORENCE DEL., Instructor, Barnard College.  
McCOSH, GLADYS K., Assistant in Zoölogy, Washington University.  
McQUINN, LENORE, Graduate Student, University of Michigan.  
MATAYOSHI, ZENKO, Assistant in Anatomy, Cornell University Medical College.  
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SWETT, FRANCIS H., Assistant in Zoölogy, Yale University.  
THARALDSEN, CONRAD E., Professor of Zoölogy, Northwestern University  
TYREE, DORA, Assistant in Histology, University of Cincinnati.  
UHLEMEYER, BERTHA, Instructor in Zoölogy, Washington University.  
VARIAN, BASIL B., Columbia University.  
VISSCHER, J. PAUL, Instructor, Washington University.  
WARREN, HERBERT S., Assistant in Zoölogy, Columbia University.  
WHITING, MRS. PHINEAS W., Annandale-on-Hudson, New York.  
WOODBIDGE, HELEN, Assistant in Zoölogy, Washington University.  
WYMAN, LELAND C., Austin Teaching Fellow, Harvard University.  
YOUNG, DONNELL B., Assistant Professor of Zoölogy, Carleton College.

#### INDEPENDENT INVESTIGATORS—Physiology.

BRADLEY, HAROLD C., Professor of Physiological Chemistry, University of Wisconsin.  
CLOWES, GEORGE H. A., Director of Research Division, Eli Lilly & Co., Indianapolis.  
COLLETT, MARY E., Instructor in Physiology, University of Buffalo.  
COLLIP, JAMES B., University of Alberta, Alberta, Canada.  
DAVIS, ALICE R., 19 Ash St., Cambridge, Mass.  
EDWARDS, DAYTON J., Assistant Professor of Physiology, Cornell University Medical College.  
GARREY, WALTER E., Professor of Physiology, Tulane University.  
HARVEY, MRS. E. N., Princeton, N. J.  
HARVEY, DR. E. NEWTON, Professor of Physiology, Princeton University.  
HECHT, SELIG, Assistant Professor of Physiology, Creighton Medical College.  
KNOWLTON, FRANK P., Professor of Physiology, Syracuse University.  
LILLIE, RALPH S., Biologist, Nela Research Laboratory, Cleveland, Ohio.  
LOEB, JACQUES, Head of Division of Experimental Biology, Rockefeller Institute for Medical Research.  
LOEB, LEO, Professor of Comparative Pathology, Washington University.  
LYON, ELIAS P., Professor of Physiology, University of Minnesota.  
MATHEWS, ALBERT P., Professor of Biochemistry, University of Cincinnati.  
MOORE, ARTHUR R., Professor of Physiology, Rutgers College.  
MORGULIS, SERGIUS, Professor of Physiological Chemistry, University of Nebraska, College of Medicine.  
MORSE, WITHROW, Professor of Biochemistry, West Virginia University.

- POND, SAMUEL E., Physiologist, Nela Research Laboratory, Cleveland.  
SEVRINGHAUS, ELMER L., Instructor in Physiological Chemistry, University of Wisconsin.  
SNYDER, CHARLES D., Professor of Experimental Physiology, Johns Hopkins University.  
SPAETH, REYNOLD A., Associate in Physiology, School of Public Health, Johns Hopkins University.  
VAN DER HEYDE, HENRI C., Heemstede, Holland.  
WARREN, HOWARD C., Professor of Psychology, Princeton University.  
WOODWARD, ALVALYN E., Demonstrator in Biology, Amherst College.

#### **BEGINNING INVESTIGATORS—Physiology.**

- BACHMAN, EDA, Research Chemist, Eli Lilly & Co., Indianapolis.  
BASKERVILL, MARGARET L., Research Assistant, Nela Research Laboratory, Cleveland, Ohio.  
BILLS, CHARLES E., Graduate Student, Johns Hopkins University.  
BLANCHARD, KENNETH C., Assistant in Biology, Clark University.  
CATTELL, WARE, Student, Cornell University.  
NI TSANG, G., University of Michigan.  
PAGE, IRVINE H., Chemist, Eli Lilly & Co., Indianapolis.  
SAMPSON, MYRA M., Assistant Professor of Zoölogy, Smith College.  
SMITH, HOMER W., Eli Lilly & Co., Indianapolis.  
SMITH, CARLOTTA G., Eli Lilly & Co., Indianapolis.  
WOLFF, NAT S., Rochester, N. Y.

#### **INDEPENDENT INVESTIGATORS—Botany.**

- BROOKS, SUMNER C., Hygienic Laboratory, United States Public Health Service.  
BROOKS, MRS. S. C., Hygienic Laboratory, United States Public Health Service.  
GATES, REGINALD R., Professor of Botany, Kings College, University of London.  
HARPER, R. A., Professor of Botany, Columbia University.  
HAZEN, TRACY E., Assistant Professor of Botany, Columbia University.  
INMAN, O. L., Harvard University.  
JONES, LEWIS R., Professor of Plant Pathology, University of Wisconsin.  
LEWIS, IVEY F., Professor of Biology, University of Virginia.  
MOORE, GEORGE T., Director Missouri Botanical Garden, St. Louis, Mo.  
OSTERHOUT, WINTHROP J. V., Professor of Botany, Harvard University.  
PHILLIPS, EVERETT F., Apiculturist, Department of Agriculture, Washington.  
SCHRAMM, J. R., Professor of Botany, Cornell University.  
TAYLOR, WILLIAM R., Instructor in Botany, University of Pennsylvania.

#### **BEGINNING INVESTIGATORS—Botany.**

- DEBORD, GEORGE G., Research Fellow in Hygiene, Harvard Medical School.  
GERSHAY, ALEXANDER, Assistant in Botany, Columbia University.  
HUTCHINSON, DOROTHY M., Auburn, Maine.  
KELLEY, ARTHUR P., Assistant in Botany, University of Pennsylvania.  
MACINNES, FRANCES J., Massachusetts Institute of Technology.  
MENESES, LAURA, Radcliffe College.



MUENSCHER, W. C., Instructor, Cornell University.  
RAY, GEORGE B., Teaching Fellow, Harvard University.  
SMITH, EDITH P., Edinburgh, Scotland.

## STUDENTS.

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1921.

### ZOÖLOGY.

ABBOTT, ELIZABETH T., Vassar College.  
ADCOCK, FLORENCE G., Student, Knox College.  
ALLAN, ISABELLE, Hunter College.  
ANASTASIA, CARMELA, Student, Connecticut College.  
ATLEE, JOHN L., JR., Student, Franklin and Marshall College.  
BENEDIX, AGNES W., Teacher, Hunter College High School.  
BENNET, AGNES H., Student, Barnard College.  
BOLLMAN, LORETTA M., Instructor, Notre Dame College.  
BROWN, FRANCES T., Oberlin College.  
BROWN, ROLAND W., Instructor, Pennsylvania Forestry School.  
BULLOCK, EMILY W., Laboratory Assistant, Mount Holyoke College.  
CALEF, DOROTHY A., University of Chicago.  
CHASE, RUTH W., Assistant in Zoölogy, University of Wisconsin.  
CORNELL, MILDRED, Student, Knox College.  
COUNCIL, FRANK E., Instructor, Texas Christian University.  
DAVIDSON, JOHN G., Principal, Delmont High School.  
EMMART, EMILY W., Student, Goucher College.  
EVERETT, M. GERTRUDE, Student, Knox College.  
FISHER, MARY J., Instructor in Zoölogy, Cornell University.  
FLEXNER, LOUIS B., Student, University of Chicago.  
GEER, GERTRUDE H., Student, Sweet Briar College.  
GOING, ELLEN M., 130 McTavish St., Montreal, Canada.  
GREGG, MABEL J., Assistant in Zoölogy, University of Wisconsin.  
GREGORY, ALLENE, Washington, D. C.  
HUBER, CHARLES B., Student, Franklin and Marshall College.  
HUSTED, GLENN, Student, Illinois Wesleyan University.  
IVES, FLORENCE B., Sweet Briar College.  
JOHNSON, ALFRED M., Student, Wabash College.  
JORDAN, EDWIN P., Student, University of Chicago.  
JOY, EDWARD A., Instructor in Biology, Tufts College.  
LINCOLN, N. STANLEY, Student, Wesleyan University.  
MCCAA, FANNY, Assistant Instructor, Agnes Scott College.  
MCCARTY, SARAH H., Student, Barnard College.  
MCGAVRAN, EDWARD G., Student, Butler College.  
MARKEE, LOIS E., Student, Knox College.  
MASBACH, HENRIETTA, Student, Goucher College.  
MEDWEDEFF, MINNIE V., Goucher College.

MURRAY, MARGARET R., Student, Goucher College.  
MYERS, EVERETT C., Student, Adelbert College, Western Reserve University.  
NICHOLS, ELIZABETH, Student, Agnes Scott College.  
NICHOLS, RHODA, Student, Wellesley College.  
PELL, ORLIE A. H., 112 East 74th St., New York City.  
SCOTT, HELEN M., Instructor, Illinois Wesleyan University.  
SMITH, ABIGAIL E., Student, Wellesley College.  
STEWART, DOROTHY R., Mount Holyoke College.  
STOLL, IONE, Student, Hunter College.  
UNGER, W. BYERS, Instructor in Biology, Lafayette College.  
VREELAND, MAEBELLE, Student, Western State Normal School.  
WICKS, NINA A., Student, Knox College.  
WILSON, CONSTANCE C., Student, Wellesley College.  
WOODHEAD, ARTHUR E., Professor of Chemistry and Biology, Western Maryland College.  
WOODWARD, MILDRED, Student, Smith College.  
YOUNG, BENJAMIN P., Assistant Professor of Zoölogy, Cornell University.

### PROTOZÖOLOGY.

AUSTIN, MARY L., Laboratory Assistant in Zoölogy, Wellesley College.  
BUCK, RUTH, University of Missouri.  
BURNS, ROBERT K., Assistant in Zoölogy, Yale University.  
FRY, HENRY J., Assistant in Zoölogy Department, Columbia University.  
GREEN, WILMOTH, Assistant in Zoölogy Laboratory, Washington University.  
LELAND, STANLEY J., DePauw University.  
MACDOUGALL, MARY S., Head of Biology Department, Agnes Scott College.  
MARTINAGLIA, GIOVANNI, Rockefeller Institute, Princeton.  
MELENEY, GRACE C., Columbia University.  
MENNINGER WILLIAM C., Cornell University Medical College.  
METCALF, RACHEL V., Instructor, Mount Holyoke College.

### EMBRYOLOGY.

BISHOP, MABEL, Head of Department of Biology, Hood College.  
BOTSFORD, E. FRANCES, Instructor in Physiology, Mount Holyoke College.  
BRAILEY, MIRIAM E., Student, Mount Holyoke College.  
BUMPUS, LAURIN D., Student, Brown University.  
CASEY, GERTRUDE U., Student, Simmons College.  
DIMICK, GERTRUDE P., Student, Smith College.  
EDINGTON, ROBERT P., Student, Wabash College.  
GOULD, ALICE, Technician in Public Health, Yale University.  
GRANT, MADELINE P., Graduate Student, Radcliffe College.  
GRAY, JULIUS C., Williams College.  
HARTWELL, RHODA A., Student, Mount Holyoke College.  
HEATON, LOUISE M., Student, Mount Holyoke College.  
HILL, CONSTANCE A., Student, Connecticut College.  
HOWARD, NELSON J., Johns Hopkins University.  
KLEMM, RALPH A., Student, Haverford College.

MALL, MARY L., Johns Hopkins Medical School.  
MARTIN, EARL A., Student, College of the City of New York.  
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WARREN, WILLIAM A., Student, Dartmouth College.  
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WILLIAMS, S. CULVER, Wesleyan University.  
YOLTON, LEROY W., Illinois Wesleyan University.

### PHYSIOLOGY.

BARNES, HILDA, Student, Smith College.  
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CHADBOURNE, EMILY R., Bryn Mawr College.  
HAUSMANN, THEO. W., Instructor in Science, Concordia Collegiate Institute.  
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LOWMAN, EDITH, Student, Vassar College.  
MILLIKIN, NEIL, Student, Johns Hopkins University.  
OSLUND, ROBERT, University of Chicago.  
PEARSE, HERMAN E., JR., Student, University of Missouri.  
PINKERTON, FLORENCE A., Student, Simmons College.  
RATHBONE, JOSEPHINE L., Wellesley College.  
TILDEN, EVELYN B., Rockefeller Institute for Medical Research.  
WALTERS, MARY J., Goucher College.  
WEBSTER, ELEANOR F., Student, University of Pennsylvania.  
WONG, A. D., Oberlin College.

### Attending Morning Lectures only.

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### BOTANY.

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CHADBOURNE, ELISABETH, Student, Smith College.  
FERGUSON, GEORGE W., Student, Dartmouth College.  
HUNT, CATHERINE T., Teacher, West Roxbury, Mass.  
HYLANDER, CLARENCE J., Student, Yale University.  
KEEFE, ANSELM, St. Norbert's College.  
KEMP, MARGARET, Student, Smith College.  
LACKEY, JAMES B., Jackson, Miss.  
MACCREIGHT, JEAN, 1358 Marlborough St., Philadelphia.  
MITCHELL, ESTHER, Student, Vassar College.

## 3. TABULAR VIEW OF ATTENDANCE.

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	1917	1918	1919	1920	1921
INVESTIGATORS—Total .....	129	93	134	136	172
Independent:					
Zoölogy .....	63	51	68	69	79
Physiology .....	23	16	24	22	26
Botany .....	8	5	7	7	13
Under Instruction:					
Zoölogy .....	24	16	21	29	34
Physiology .....	6	3	10	7	11
Botany .....	5	2	4	2	9
STUDENTS—Total .....	83	69	128	120	120
Zoölogy .....	46	41	55	56	53
Protozoölogy .....	—	—	15	15	11
Embryology .....	16	12	33	26	28
Physiology .....	13	10	17	15	18
Botany .....	8	6	8	8	10
TOTAL ATTENDANCE .....	212	162	262	256	292
INSTITUTIONS REPRESENTED—Total	77	72	88	86	95
By investigators .....	60	49	61	55	67
By students .....	36	38	62	57	53
SCHOOLS AND ACADEMIES REPRESENTED.					
By investigators .....	2	—	—	1	—
By students .....	5	—	4	7	—

#### 4. SUBSCRIBING AND COOPERATING INSTITUTIONS IN 1921.

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BARNARD COLLEGE	RADCLIFFE COLLEGE
BOWDOIN COLLEGE	ROCKEFELLER FOUNDATION
BRYN MAWR COLLEGE	ROCKEFELLER INSTITUTE FOR MED-
BUTLER COLLEGE	ICAL RESEARCH
COLLEGE OF PHYSICIANS AND SUR-	SIMMONS COLLEGE
GEONS	SMITH COLLEGE
COLUMBIA UNIVERSITY	TUFTS COLLEGE
CONNECTICUT COLLEGE	UNIVERSITY OF CHICAGO
CORNELL UNIVERSITY	UNIVERSITY OF CINCINNATI
CORNELL UNIVERSITY MEDICAL	UNIVERSITY OF ILLINOIS
COLLEGE	UNIVERSITY OF KANSAS
CREIGHTON UNIVERSITY	UNIVERSITY OF MICHIGAN
DARTMOUTH COLLEGE	UNIVERSITY OF MISSOURI
ELI LILLY & Co.	UNIVERSITY OF NEBRASKA
FEDERAL BOARD OF VOCATIONAL	UNIVERSITY OF PENNSYLVANIA
EDUCATION	UNIVERSITY OF PHILIPPINES
GOUCHER COLLEGE	UNIVERSITY OF VIRGINIA
HARVARD UNIVERSITY	UNIVERSITY OF WISCONSIN
HARVARD UNIVERSITY MEDICAL	VASSAR COLLEGE
SCHOOL	WABASH COLLEGE
HUNTER COLLEGE	WASHINGTON UNIVERSITY
ILLINOIS WESLEYAN UNIVERSITY	WESLEYAN UNIVERSITY
JOHNS HOPKINS UNIVERSITY	WELLESLEY COLLEGE
KNOX COLLEGE	WESTERN RESERVE UNIVERSITY
MASSACHUSETTS INSTITUTE OF	WESTERN STATE NORMAL SCHOOL
TECHNOLOGY	WILLIAMS COLLEGE
MOUNT HOLYOKE COLLEGE	WISTAR INSTITUTE OF ANATOMY
NELA RESEARCH LABORATORY	AND BIOLOGY
OBERLIN COLLEGE	YALE UNIVERSITY
PRINCETON UNIVERSITY	

#### SCHOLARSHIP TABLES.

THE LUCRETIA CROCKER SCHOLARSHIPS FOR TEACHERS IN BOSTON,  
SINCE 1888.

SCHOLARSHIP OF \$100.00, SUPPORTED BY A FRIEND OF THE LABORATORY,  
SINCE 1898.

THE NEW LONDON BRANCH OF THE AMERICAN ASSOCIATION OF UNI-  
VERSITY WOMEN, SINCE 1920.

## 5. EVENING LECTURES, 1921.

Friday, July 1,

DR. W. J. V. OSTERHOUT....."Injury and Recovery."

Tuesday, July 5,

DR. E. R. CLARK....."The Reaction of Living Cells in  
the Tail of the Frog Larvæ to  
Foreign Substances."

Friday, July 8,

DR. GARY N. CALKINS....."Differentiation and Vitality in  
Protozoa."

Tuesday, July 12,

DR. R. S. LILLIE....."The Conditions of Growth in  
Living and in Non-living Sys-  
tems."

Friday, July 15,

DR. WALLACE O. FENN....."Phagocytosis."

Tuesday, July 19,

DR. E. V. COWDRY....."The Conflict between Old and  
New Medicine in China."

Friday, July 22,

DR. G. H. A. CLOWES....."Some Physical Chemical Con-  
cepts of Protoplasmic Structure."

Tuesday, July 26,

DR. H. H. DONALDSON....."Rat Studies."

Friday, July 29,

DR. I. W. BAILEY....."The Significance of the Cambium  
in the Investigation of Certain  
Cytological and Physiological  
Problems."

Tuesday, August 2,

MR. WM. L. UNDERWOOD....."Adventures of a Sage-brush  
Tourist in Wyoming."

Friday, August 5,

DR. E. E. SLOSSON....."History from the Standpoint of  
the Second Law of Thermo-dy-  
namics."

Monday, August 8,

DR. S. C. BROOKS....."Immunity and Ultra-violet Light."

## 6. THE ORGANIZATION AND POLICIES OF THE MARINE BIOLOGICAL LABORATORY.

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The Marine Biological Laboratory is an outpost of the higher educational and research institutions of the country. Representatives of such institutions are eligible to membership in the controlling body, the Corporation of the Marine Biological Laboratory, composed of over 400 persons, mostly biologists. Institutions also have further control and interest through their ability for a moderate sum to use assigned quarters for members of their staff or student body. They may thus from year to year continue to occupy the same quarters and possess veritable extra-territorial control. The Laboratory actually belongs to the biologists and through them to their institutions. The function of the administration of the Laboratory is the execution of a trust held for common use.

The organization thus provides for a nominal sum facilities that would cost each institution many times the amount to provide independently. This is important even for the largest institutions, and indispensable for all the smaller institutions that aim to maintain the research spirit of members of their staffs.

1. *Organization.*—The Marine Biological Laboratory is an independent Corporation operating under its own charter. The act of incorporation of the Marine Biological Laboratory and the By-laws of the Corporation are printed in each of the Annual Reports. The membership of the Corporation and of the Board of Trustees is also printed in the same places. The Corporation meets on the second Tuesday in August each year at the Laboratory. At each annual meeting it elects eight trustees to serve four years, and a Treasurer and Clerk of the Corporation who are *ex officio* members of the Board of Trustees; the Director and Assistant Director, who are appointed by the Trustees, are also *ex officio* members of the Board.

The Trustees, who are mostly biologists selected for their scientific attainments, have the control and management of the affairs of the Corporation; they, on their part, delegate most of their

functions to an executive committee of five members, including the Director and Assistant Director *ex officio*.

The membership of the Corporation represents all important phases of biological research and most American institutions in which such work is done. Any competent investigator qualified for admission to the principal national research societies in Biology is eligible for membership, which is also open to other persons willing and qualified to render useful service to the Corporation. (See rules of eligibility in the records of the Clerk of the Corporation.) The ultimate control and ownership of the Laboratory is vested in the Corporation.

2. *Purpose*.—The primary purpose of the Marine Biological Laboratory is the advancement of Biological Science. This is the first consideration in every matter of policy. The *scope* is conceived as broad as the field of biology, but the *aim* is to promote the fundamental and more general rather than the systematic and more special problems. The fundamental problems trace back to the cell, and are based ultimately on physics and chemistry; they thus require some of the special equipment of both of these fields. Considerations of pure science are primary and those of utility secondary, though recognized as important. Thus the work of the Laboratory bears important relations to medicine, agriculture, fisheries, and economic biology.

3. *Research*.—Individual research is the foundation of all advance in science. Hence all policies of the Laboratory are directed toward the investigator with the object of furnishing him opportunities, facilities, and freedom for research.

The Laboratory has no set program of research as an institution, but aims to be hospitable to all branches of biological science; it should thus reflect and stimulate progress in all directions, if not simultaneously, at least in the course of time.

It is the policy of the Laboratory to favor such forms of coöperation in research as develop naturally. The mere association of so many investigators as meet annually at the Laboratory inevitably develops coöperative relations of various kinds, and this is regarded as one of the most valuable results of the organization.

Investigators are admitted to the Marine Biological Laboratory



on the judgment of the Director as to their fitness to make good use of the facilities offered.

Two classes of investigators are recognized: those who work independently, and those receiving instruction in investigation.

Investigators' fees are generally paid by the institution to which the investigator belongs, but it is at the discretion of the Director to admit any investigator without charge, and it has never been the policy to refuse admission to any independent investigator solely on the issue of a fee.

The more experienced investigators, or a selected group thereof, guide the research of beginning investigators. No group in the organization will be of more significance for the future of the Laboratory than beginners in research.

Admission to the Laboratory is not limited by considerations of nationality. It has become desirable to pursue a positive instead of a merely passive or negative attitude in the matter of international representation.

The Laboratory is open to investigators throughout the year.

The Laboratory is open on the same terms to both sexes.

4. *Instruction.*—In pursuit of the primary purpose of the Laboratory it is essential that provision should be made for the production and training of investigators. It is important that a certain part of such provision should be in the Laboratory itself. Hence instruction of a strictly professional character is also a settled policy of the Laboratory. Experience has shown that instruction may be overemphasized to the detriment of research; hence the policy of the Laboratory is to limit the courses of instruction offered (only five for many years), to require fees adequate to pay all the expenses of instruction, to limit the numbers registered in each course, and to admit no one without satisfactory recommendations.

The intellectual atmosphere of the Laboratory is favorable in the highest possible degree to the development of the research spirit in young students. For their own sake and for the sake of the future development of biology they should not be excluded from the Laboratory.

In the case of all courses offered, the facilities of the Laboratory, whether of personnel or material, are such as to guarantee that

they may be offered to greater advantage here than elsewhere. There is no attempt to duplicate university or college courses.

The Laboratory assigns no grades in courses and sets no examinations. The Laboratory will therefore not certify to attainments in any course, but individual instructors are at liberty to do so on their own responsibility.

Instructors in courses are selected primarily for their interest in and qualifications for research.

Salaries of instructors are calculated to pay expenses of travel and living only for the duration of the course.

The number of instructors in courses is sufficient to leave each one adequate time for his own research.

Courses of instruction are given only during six weeks in the summer.

5. *Coöperating Institutions.*—The organization of the Laboratory, being primarily a coöperative society of biological investigators and of the institutions that they represent, is such that a system of subscribing and coöperating institutions has been gradually developed (see p. 302); these relationships should be further extended and strengthened.

As far as possible the same space is reserved in successive years for the coöperating institutions. But, except where definite contracts exist, the assignment of space is at the discretion of the Director.

The Laboratory aims to be an outpost of the biological departments of universities, colleges, and research laboratories; each has its part in the Laboratory according to its needs and acquired rights.

6. *Financial.*—In general, it is the aim of the Laboratory to make all departments except research self-supporting. The Laboratory should depend as little as possible upon actual endowment and as much as possible upon earnings and good will. It is the policy of the Laboratory to have endowment funds held in trust.

The financial administration should be such as to secure confidence; to this end there is a complete accounting system for all income and expenditures and an annual audit by a firm of auditors, which is published each year.

A budget estimate is prepared in December of each year for the

year following and submitted to the Board of Trustees, or Executive Committee, for consideration.

7. *Staff*.—The Assistant Director and operating staff on annual appointments receive their livelihood from the Laboratory; the salaries should be ample in order to secure the best men.

The scientific staff on the research side serves without salary; salaries of instructors are calculated to pay expenses of travel and living for the duration of the course.

There is no permanent scientific staff. The establishment of such a staff would tend to endanger the principle of freedom of development for all branches of biology by favoring a few. It would also set the Laboratory in competition with universities and research institutions for men and weaken the spirit of coöperation of such institutions. It would favor a few individuals at the expense of the many.

8. *The Supply Department* serves primarily to obtain and distribute living materials for research within the institution; class supplies are also furnished. This service is furnished without additional fee to investigators and students. This is an essential part of the organization. It saves the time of the investigators and through intelligent collecting depletion of the grounds is safeguarded.

The major part of the work of the Supply Department is, however, to furnish biological supplies to institutions. It is the policy to develop this business as far as possible. The main advantages are: (1) The profits from sales are an important item of income. (2) The business is continuous throughout the year, and the Laboratory is thus enabled to keep together a permanent skilled staff of collectors. (3) A real service is rendered to biological education and research by providing a source of standardized and reliable material of many kinds. (4) This service constitutes an important item of good-will.

9. *The Department of Chemical Supplies*.—In general, it is the function of this department to furnish all standard apparatus and supplies ordinarily used in the work of investigation at the Laboratory with no additional charge. Exceptions are noted in the printed rules of the department. Microscopes, microtomes, and

"special" apparatus and reagents are not furnished. The policy is summed up in "service to the investigator."

10. *The Library*.—It is the policy of the Laboratory to develop the best possible library for current biological research. Books of historical interest only are regarded as secondary in importance. The development of this policy will involve the establishment of a very large library in the course of time, and this should be pursued as rapidly as possible.

11. *The Mess* is conducted for the benefit of investigators and students. Rates are calculated to pay the cost of operation, equipment, rent, and upkeep in general, and not for profit.

Rules and regulations have been established governing its use. These are subject to revision by the Executive Committee of the Laboratory at any time.

12. *Housing Facilities*.—The housing facilities furnished by the Laboratory are calculated to meet the deficit in the local supply and to keep local prices at a reasonable rate. As the local provision has become progressively less adequate, it has been necessary to make increasing provision for workers. The purchase of the Gansett property, twenty acres within a mile of the Laboratory, was determined by this consideration. The development of the Laboratory obviously depends upon adequate housing facilities at reasonable rates.

13. *Biological Bulletin*.—One of the policies of the Laboratory should be to aid in the provision of adequate means for publication of biological research in America. The establishment of the BIOLOGICAL BULLETIN in 1899 was in pursuit of this policy; it is now in its forty-first volume. A larger responsibility should be undertaken as soon as means permit.

14. *Future Development*.—The policy of attempting adequately to represent biological research in America by free association of, and government by, the investigators themselves determines all questions of future development. The next step will generally be apparent, as, for instance, the present need of a biophysical and biochemical laboratory, and of a building for library, administration, and auditorium. It is the policy of the Laboratory to be ready for advance by the nature and morale of its organization and by control of sufficient land.

## 7. MEMBERS OF THE CORPORATION.

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### I. LIFE MEMBERS.

- ALLIS, MR. E. P., JR., Palais Carnoles, Menton, France.  
ANDREWS, MRS. GWENDOLEN FOULKE, Baltimore, Md.  
BILLINGS, MR. R. C., 66 Franklin St., Boston, Mass.  
CAREY, MR. ARTHUR ASTOR, Fayerweather St., Boston, Mass.  
CLARKE, PROF. S. F., Williamstown, Mass.  
CONKLIN, PROF. EDWIN G., Princeton University, Princeton,  
N. J.  
CRANE, MR. C. R., Woods Hole, Mass.  
EVANS, MRS. GLENDOWER, 12 Otis Place, Boston, Mass.  
FARLOW, PROF. W. G., Harvard University, Cambridge, Mass.  
FAY, MISS S. B., 88 Mt. Vernon St., Boston, Mass.  
FOLSOM, MISS AMY, 88 Marlboro St., Boston, Mass.  
FOOT, MISS KATHERINE, 955 Park Ave., New York City, N. Y.  
GARDINER, MRS. E. G., Woods Hole, Mass.  
GARDINER, MISS EUGENIA, 15 W. Cedar St., Boston, Mass.  
HARRISON, EX-PROVOST C. C., University of Pennsylvania, Phila-  
delphia, Pa.  
JACKSON, MISS M. C., 88 Marlboro St., Boston, Mass.  
JACKSON, MR. CHAS. C., 24 Congress St., Boston, Mass.  
KIDDER, MR. NATHANIEL T., Milton, Mass.  
KING, MR. CHAS. A.  
LEE, MRS. FREDERIC S., 279 Madison Ave., New York City, N. Y.  
LOWELL, MR. A. LAWRENCE, 17 Quincy St., Cambridge, Mass.  
MARRS, MRS. LAURA NORCROSS, 9 Commonwealth Ave., Boston,  
Mass.  
MASON, MISS E. F., 1 Walnut St., Boston, Mass.  
MASON, MISS IDA M., 1 Walnut St., Boston, Mass.  
MEANS, MR. JAMES HOWARD, 196 Beacon St., Boston, Mass.  
MERRIMAN, MRS. DANIEL, 73 Bay State Road, Boston, Mass.  
MINNS, MISS SUSAN, 14 Louisburg Square, Boston, Mass.  
MINNS, MR. THOMAS, 14 Louisburg Square, Boston, Mass.  
MORGAN, MR. J. PIERPONT, JR., Wall and Broad Sts., New York  
City, N. Y.

- MORGAN, PROF. T. H., Columbia University, New York City, N. Y.
- MORGAN, MRS. T. H., New York City, N. Y.
- NOYES, MISS EVA J.
- NUNN, MR. LUCIAN L., Telluride, Colo.
- OSBORN, PROF. HENRY F., American Museum of Natural History, New York City, N. Y.
- PHILLIPS, DR. JOHN C., Windy Knob, Wenham, Mass.
- PHILLIPS, MRS. JOHN C., Windy Knob, Wenham, Mass.
- PORTER, DR. H. C., University of Pennsylvania, Philadelphia, Pa.
- PULSIFER, MR. W. H., Newton Center, Mass.
- ROGERS, MISS A. P., 5 Joy St., Boston, Mass.
- SEARS, DR. HENRY F., 86 Beacon St., Boston, Mass.
- SHEDD, MR. E. A.
- SMITH, MRS. C. C., 286 Marlboro St., Boston, Mass.
- THORNDIKE, DR. EDWARD L., Teachers College, Columbia University, New York City, N. Y.
- TRELEASE, PROF. WILLIAM, University of Illinois, Urbana, Ill.
- WARE, MISS MARY L., 41 Brimmer St., Boston, Mass.
- WHITNEY, MR. HENRY M., Brookline, Mass.
- WILCOX, MISS MARY A., Wellesley College, Wellesley, Mass.
- WILLIAMS, MRS. ANNA P., 505 Beacon St., Boston, Mass.
- WILSON, DR. E. B., Columbia University, New York City, N. Y.
- WILSON, PROF. W. P., Commercial Museum, Philadelphia, Pa.

## 2. REGULAR MEMBERS, AUGUST, 1921.

- ADDISON, DR. W. H. F., University of Pennsylvania Medical School, Philadelphia, Pa.
- ADAMS, MISS A. E., Mount Holyoke College, South Hadley, Mass.
- AGERSBORG, MR. H. P. K., University of Illinois, Urbana, Ill.
- ALLEE, DR. W. C., University of Chicago, Chicago, Ill.
- ALLEN, PROF. EZRA, Ursinus College, Collegeville, Pa.
- ALLYN, MISS HARRIET M., 264 Jefferson Ave., New London, Conn.
- ALTENBURG, DR. EDGAR, Rice Institute, Houston, Texas.
- ANDERSON, DR. E. G., Carnegie Institution, Cold Spring Harbor, N. Y.

ATTERBURY, MRS. RUTH R., College of Physicians and Surgeons,  
New York City.

BAITSELL, DR. GEORGE A., Yale University, New Haven, Conn.

BAKER, MRS. L. D., 123 Chiswick Road, Boston, Mass.

BAKER, DR. E. H., 5729 Kimbark Ave., Chicago, Ill.

BALDWIN, DR. F. M., Iowa State College, Ames, Iowa.

BANCROFT, PROF. F. W., Aloha Farm, Concord, Calif.

BECKWITH, DR. CORA J., Vassar College, Poughkeepsie, N. Y.

BEHRE, DR. ELINOR H., Louisiana State University, Baton Rouge,  
La.

BIGELOW, PROF. M. A., Teachers College, Columbia University,  
New York City.

BIGELOW, PROF. R. P., Mass. Institute of Technology, Cambridge,  
Mass.

BINFORD, PROF. RAYMOND, Guilford College, Guilford College,  
N. C.

BORING, DR. ALICE M., Wellesley College, Wellesley, Mass.

BOX, MISS CORA MAY, University of Cincinnati, Cincinnati, Ohio.

BOWEN, DR. ROBERT H., Columbia University, New York City.

BRADLEY, PROF. HAROLD C., University of Wisconsin, Madison,  
Wis.

BRIDGES, DR. CALVIN B., Columbia University, New York City.

BRUMFIEL, DR. DANIEL M., University of Iowa, Iowa City, Iowa.

BUCKINGHAM, MISS EDITH N., 342 Marlboro St., Boston, Mass.

BUDINGTON, PROF. R. A., Oberlin College, Oberlin, Ohio.

BUMPUS, PROF. H. C., Brown University, Providence, R. I.

BYRNES, DR. ESTHER F., 193 Jefferson Ave., Brooklyn, N. Y.

CALKINS, PROF. GARY N., Columbia University, New York City.

CALVERT, PROF. PHILIP P., University of Pennsylvania, Phila-  
delphia, Pa.

CARLSON, PROF. A. J., University of Chicago, Chicago, Ill.

CAROTHERS, DR. ELEANOR E., University of Pennsylvania, Phila-  
delphia, Pa.

CARPENTER, PROF. FREDERIC W., Trinity College, Hartford, Conn.

CARROLL, PROF. MITCHEL, Franklin and Marshall College, Lan-  
caster, Pa.

CARVER, PROF. GAIL L., West Lake, Ga.

CARY, DR. L. R., Princeton University, Princeton, N. J.

- CASEY, COLONEL THOMAS L., Washington, D. C.
- CASTEEL, DR. D. B., University of Texas, Austin, Texas.
- CATTELL, PROF. J. McKEEN, Garrison-on-Hudson, N. Y.
- CATTELL, MR. McKEEN, Harvard Medical School, Boston, Mass.
- CHAMBERS, DR. ROBERT, JR., Cornell University Medical College, New York City.
- CHARLTON, DR. HARRY H., University of Missouri, Columbia, Mo.
- CHIDESTER, PROF. F. E., West Virginia University, Morgantown, W. Va.
- CHILD, PROF. C. M., University of Chicago, Chicago, Ill.
- CLAPP, PROF. CORNELIA M., Mount Holyoke College, South Hadley, Mass.
- CLARK, PROF. E. R., University of Missouri, Columbia, Mo.
- CLOWES, PROF. G. H. A., Eli Lilly Co., Indianapolis, Ind.
- COE, PROF. W. R., Yale University, New Haven, Conn.
- COHN, DR. EDWIN J., 25 Follen St., Cambridge, Mass.
- COLE, DR. LEON J., College of Agriculture, Madison, Wis.
- COLLETT, DR. MARY E., University of Buffalo, Buffalo, N. Y.
- COLTON, PROF. H. S., Ardmore, Pa.
- COOLIDGE, MR. C. A., Ames Building, Boston, Mass.
- COPELAND, PROF. MANTON, Bowdoin College, Brunswick, Maine.
- COUTANT, MRS. MARY W., Barnard College, Columbia University, New York City.
- COWDRY, DR. E. V., Rockefeller Institute, New York City, N. Y.
- CRAMPTON, PROF. H. E., Barnard College, Columbia University, New York City.
- CRANE, MRS. C. R., Woods Hole, Mass.
- CURTIS, PROF. W. C., University of Missouri, Columbia, Mo.
- CURTIS, DR. MAYNIE R., Crocker Laboratory, Columbia University, New York City.
- DANCHAKOFF, DR. VERA, College of Physicians and Surgeons, New York City.
- DAVIS, DR. DONALD W., College of William and Mary, Williamsburg, Va.
- DAVIS, PROF. BRADLEY M., University of Michigan, Ann Arbor, Mich.
- DAVIS, DR. ALICE R., Harvard Medical School, Boston, Mass.
- DAWSON, DR. J. A., Dalhousie University, Halifax, Nova Scotia.



- DEDERER, DR. PAULINE H., Connecticut College, New London, Conn.
- DERICK, PROF. CARRIE M., McGill University, Montreal, Canada.
- DEXTER, DR. J. S., University of Saskatchewan, Saskatoon, Saskatchewan.
- DODDS, PROF. G. S., Medical School, University of West Virginia, Morgantown, W. Va.
- DONALDSON, PROF. H. H., Wistar Institute of Anatomy and Biology, Philadelphia, Pa.
- DONALDSON, DR. JOHN C., University of Pittsburgh, School of Medicine, Pittsburgh, Pa.
- DREW, PROF. GILMAN A., Marine Biological Laboratory, Woods Hole, Mass.
- DUNGAY, DR. NEIL S., Carleton College, Northfield, Minn.
- DUNN, DR. ELIZABETH H., Woods Hole, Mass.
- EDWARDS, DR. D. J., Cornell University Medical College, New York City.
- EIGENMANN, PROF. C. H., University of Indiana, Bloomington, Ind.
- ELLIS, DR. F. W., Monson, Mass.
- FARNUM, MISS LOUISE W., 43 Hillhouse Ave., New Haven, Conn.
- FIELD, MISS HAZEL E., Sophie Newcomb College, New Orleans, La.
- FINLEY, DR. CHARLES W., Lincoln School, New York City.
- FISHER, MISS MARY J., Cornell University, Ithaca, N. Y.
- FRANKLIN, DR. CHRISTINE LADD, New York City, N. Y.
- GAGE, PROF. S. H., Cornell University, Ithaca, N. Y.
- GARREY, PROF. W. E., Tulane University, Richardson Memorial, New Orleans, La.
- GATES, PROF. R. RUGGLES, University of London, London, England.
- GLASER, PROF. O. C., Amherst College, Amherst, Mass.
- GLASER, PROF. R. W., Rockefeller Institute for Medical Research, Princeton, N. J.
- GOLDFARB, PROF. A. J., College of the City of New York, New York City.
- GOODRICH, DR. H. B., Wesleyan University, Middletown, Conn.
- GRAVE, PROF. CASWELL, Washington University, St. Louis, Mo.

- GRAVE, PROF. B. H., Wabash College, Crawfordsville, Ind.
- GREGORY, DR. LOUISE H., Barnard College, Columbia University, New York City.
- GREENMAN, PROF. M. J., Wistar Institute of Anatomy and Biology, Philadelphia, Pa.
- GUNTHER, MISS MAUDE C., Business High School, Washington, D. C.
- GUYER, PROF. M. F., University of Wisconsin, Madison, Wis.
- HANCE, DR. ROBERT T., North Dakota Agricultural College, Fargo, N. D.
- HARGITT, PROF. C. W., Syracuse University, Syracuse, N. Y.
- HARGITT, PROF. GEORGE T., Syracuse University, Syracuse, N. Y.
- HARMAN, DR. MARY T., Kansas State Agricultural College, Manhattan, Kans.
- HARPER, PROF. R. A., Columbia University, New York City.
- HARRISON, PROF. ROSS G., Yale University, New Haven, Conn.
- HARVEY, PROF. E. N., Princeton University, Princeton, N. J.
- HARVEY, MRS. E. N., Princeton, N. J.
- HAYDEN, MISS MARGARET A., Wellesley College, Wellesley, Mass.
- HEATH, PROF. HAROLD, Palo Alto, Calif.
- HEGNER, PROF. R. W., Johns Hopkins University, Baltimore, Md.
- HEILBRUNN, DR. L. V., University of Michigan, Ann Arbor, Mich.
- HESS, PROF. WALTER N., DePauw University, Greencastle, Ind.
- HINRICHS, MISS MARIE A., University of Chicago, Chicago, Ill.
- HOADLEY, MR. LEIGH, University of Chicago, Chicago, Ill.
- HOAR, MR. D. BLAKELY, 161 Devonshire St., Boston, Mass.
- HOGUE, DR. MARY J., Johns Hopkins Medical School, Baltimore, Md.
- HOLMES, PROF. S. J., University of California, Berkeley, Calif.
- HOOKE, PROF. D. R., Johns Hopkins Medical School, Baltimore, Md.
- HOSKINS, MRS. ELMER R., University of Arkansas Medical School, Little Rock, Ark.
- HOWE, DR. H. E., National Research Council, Washington, D. C.
- HOWLAND, MISS RUTH B., Sweet Briar College, Sweet Briar, Va.
- HOYT, DR. WILLIAM D., Washington and Lee University, Lexington, Va.
- HYDE, DR. IDA H., University of Kansas, Lawrence, Kans.

- HYMAN, DR. LIBBIE H., University of Chicago, Chicago, Ill.
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